SAS to SAS/SATA II JBOD Subsystem

User Manual

Revision 1.1

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Chapter 1 Introduction

The 12 bays EPICa JBOD Subsystem

The EPICa EP-2123J/JD-S3S3 is a 19-inch 2U rackmount JBOD unit. It comes with 12 hot-swappable bays and is the Proware's most versatile SAS/SATA II Disk Expansion system, ideal for high capacity and scalability storage in most popular OS environments. Based on 3Gb SAS Channel host interfaces, the EP-2123J/JD-S3S3 supporting the choice of SAS and SATA II drive configurations to deliver the best cost-performance index with higher bandwidth.

The ability to mix SAS and SATA drives allows the EP-2123J/JD-S3S3 to be used for a range of applications that require different price/performance characteristics. Cost-effective SATA drives can be selected for capacity orientated storage such as disk-to-disk backup and the storage of reference data. Higher specification SAS drives can be employed for I/O intensive applications including transactional databases. Hosting multiple tiers of data in an EP-2123J/JD-S3S3 configuration gives organizations the flexibility to meet both their technical requirements and budgetary constraints with a single unified solution.

1.1 Features

Modular Design with Common Parts

- Inventory control efficiency
- Cost-saving benefits to the end-user

Power Supply

- Power Supply and cooling system contained in 1 module for efficient cooling
- 400W power supplies to meet the future HDD power consumption

Enclosure

- Modules are interchangeable with other EPICa products
- Hardware expansion slots keep you up-to-date on the latest technologies
- Incorporates a cableless design for maximum signal integrity

SES

- Utilizes industry-standard SCSI Enclosure Services to monitor enclosure and disk environmental conditions

1.2 Technical Specifications

Model	EP-2123J-S3S3 / EP-2123JD-S3S3
RAID Controller	JBOD
JBOD Controller	Single / Redundant
Host Interface	4x mini SAS (3Gb/s)
Disk Interface	SAS 3Gb or SATA II
SAS expander	4x mini SAS (3Gb/s)
Capacity	
- Direct Attached	12 Disks
- Expansion	Refers to controller specification
Monitor Port support	Yes
Enclosure	
Platform	Rackmount
Form Factor	2U
# of Hot Swap Trays	12
Tray Lock	Yes
Disk Status Indicator	Access / Fail LED
Backplane	SAS / SATA II Single BP
# of PS/Fan Modules	400W x 2 w/PFC
# of Fans	2
Power requirements	AC 90V ~ 264V Full Range, 7.5A ~ 4A, 47Hz ~ 63Hz
Environmental	
Relative Humidity	10% ~ 85% Non-condensing
Operating Temperature	10°C ~ 40°C (50°F ~ 104°F)
Physical Dimension	590(L) x 482 (W) x 88(H) mm
Weight (Without Disk)	18.2 / 19.7 Kg

1.3 Unpacking the JBOD Subsystem

The shipping package contains the following:

	JBOD Subsystem Unit
	Two (2) power cords
	One serial cable (RJ11 to DB9) Note: Two serial cables for dual JBOD controllers
	One external Mini SAS cable SFF-8088 to SFF-8088 Note: Two mini SAS cables for dual JBOD controllers
	One(1) JBOD Controller Module Plate Cover NOTE: For Dual RAID Controller
	One(1) PSFM Plate Cover
	User Manual

NOTE: If any damage is found, contact the dealer or vendor for assistance.

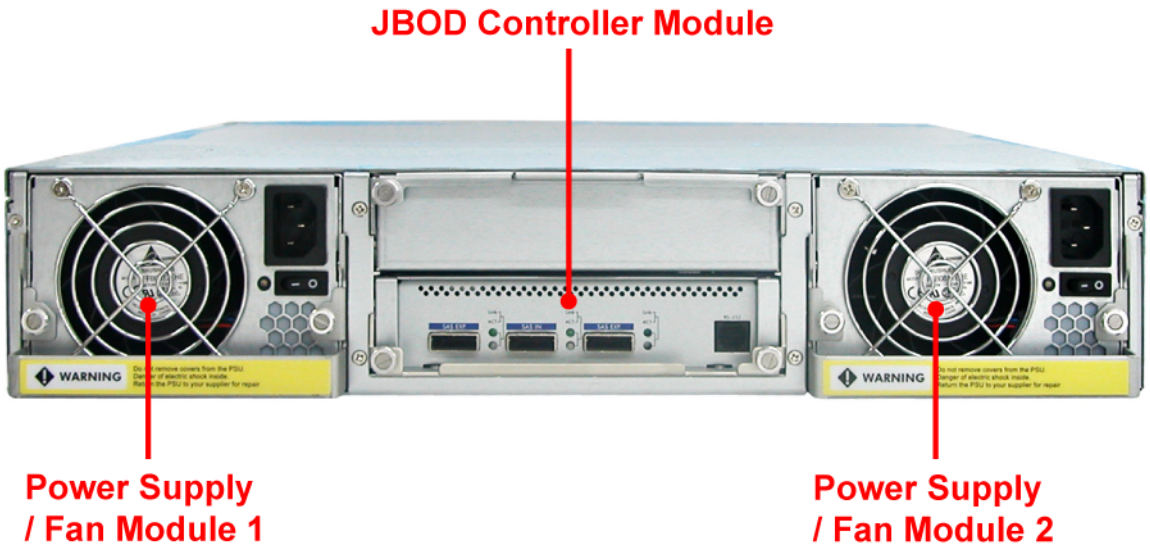
1.4 Identifying Parts of the JBOD Subsystem

The illustrations below identify the various parts of the expansion chassis.

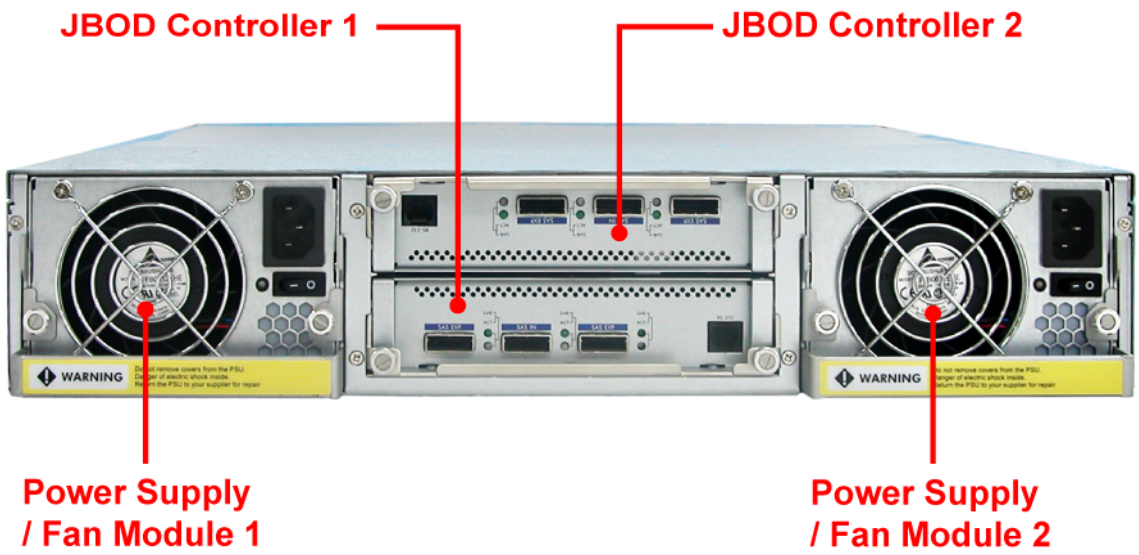
1.4.1 Front View

1.4.2 Rear View

Single JBOD Controller



Dual JBOD Controller

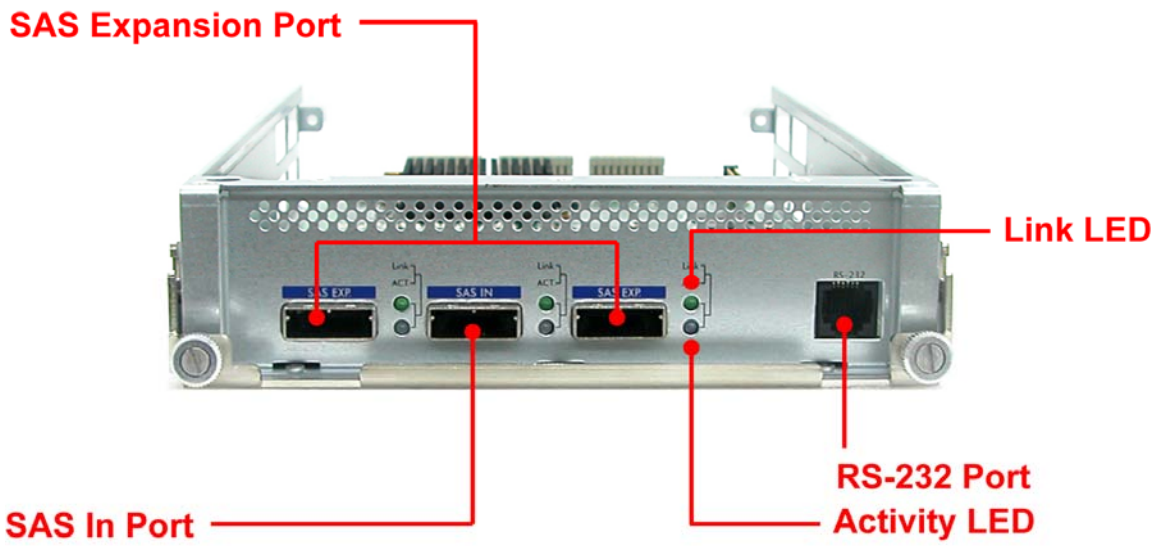


1.4.3 JBOD Controller Module

The EPICa JBOD subsystem includes a single or dual 3Gb SAS-to-SAS/SATA II JBOD Controller Module.

JBOD Controller Module

1.4.3.1 JBOD Controller Panel



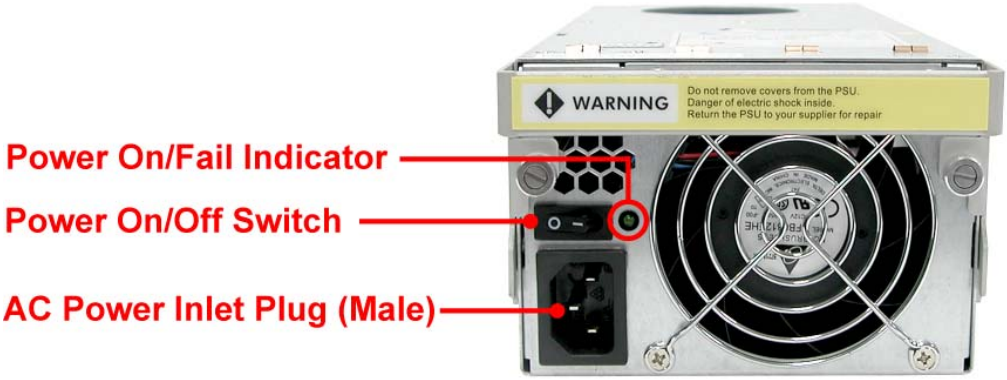
Part	Description
SAS In Port	Use to connect to SAS HBA or to RAID subsystem's SAS Expansion Port.
SAS Expansion Port	Use to connect to the SAS In Port of another JBOD subsystem.
RS-232 Port	Use to upgrade the firmware of the JBOD controller. Connect the RJ11-to-DB9 serial cable to your system's serial port.

Indicator	Color	Description
Link LED	Green	Indicates expander has connected or linked.
Activity LED	Blinking Blue	Indicates the expander is busy and being accessed.

1.5 Power Supply Fan Module (PSFM)

The EPICa JBOD subsystem contains **two 400W Power Supply / Fan Modules**. All PSFMs are inserted into the rear of the chassis.

1.5.1 PSFM Panel


WARNING
Do not remove covers from the PSU.
Danger of electric shock inside.
Return the PSU to your supplier for repair
Power On/Fail Indicator
Power On/Off Switch
AC Power Inlet Plug (Male)

The panel of the Power Supply/Fan Module contains: the Power On/Off Switch, the AC Inlet Plug, and a Power On/Fail Indicator showing the Power Status LED, indicating ready or fail.

Each fan within a PSFM is powered independently of the power supply within the same PSFM. So if the power supply of a PSFM fails, the fan associated with that PSFM will continue to operate and cool the enclosure.

When the power cord connected from main power source is inserted to the AC Power Inlet, the power status LED becomes RED. When the switch of the PSFM is turned on, the LED will turn GREEN. When the Power On/Fail LED is GREEN, the PSFM is functioning normally.

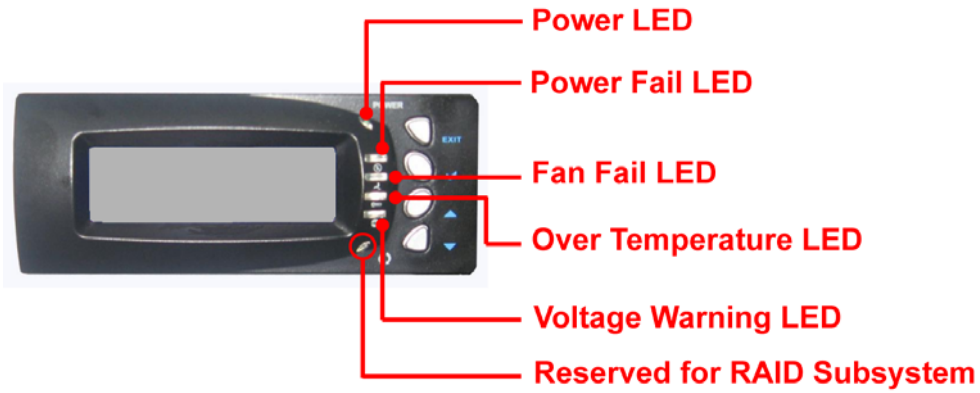
NOTE: Each PSFM has one Power Supply and one Fan. PSFM 1 has Power#1 and Fan#1, and PSFM 2 has Power#2 and Fan#2. When the Power Supply of a PSFM fails, the PSFM need not be removed from the slot if replacement is not yet available. The fan will still work and provide necessary airflow inside the enclosure.

In replacing the failed PSFM, refer to section 3.2.2 of this manual.

NOTE: After replacing the Power Supply Fan Module and turning on the Power On/Off Switch of the PSFM, the Power Supply will not power on immediately. The Fans in the PSFM will spin-up until the RPM becomes stable. When Fan RPM is already stable, the RAID controller will then power on the Power Supply. This process takes more or less 30 seconds. This safety measure helps prevent possible Power Supply overheating when the Fans cannot work.

1.6 LCD Display Panel

1.6.1 LCD Panel LED



Parts	Function
Power LED	Green indicates power is ON.
Power Fail LED	If one of the redundant power supply unit fails, this LED will turn to RED and alarm will sound.
Fan Fail LED	Turn RED when fan 1 or 2 fails, or speed is lower than 500 RPM.
Over Temperature LED	If disk temperatures exceed 60°C, the Over Temperature LED will turn RED and alarm will sound.
Voltage Warning LED	An alarm will sound if detected voltage in the controller is abnormal and LED will turn RED.

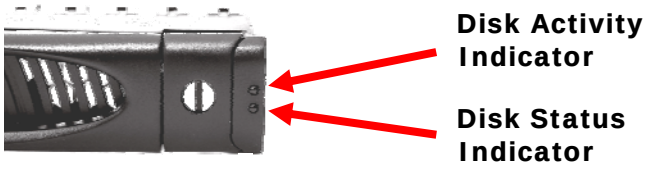
1.6.2 LCD Panel Function Buttons

Parts		Function
Up and Down Arrow buttons	▲ ▼	Use the Up or Down arrow keys to go through the information on the LCD screen. This is also used to move between each menu.
Select button	✔	This is used to enter the option you have selected.
Exit button	EXIT	Press this button to return to the previous menu.

1.7 Drive Carrier Module

The Drive Carrier Module houses a 3.5 inch hard disk drive. It is designed for maximum airflow and incorporates a carrier locking mechanism to prevent unauthorized access to the HDD.

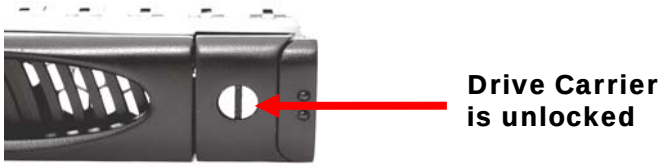
1.7.1 Disk Drive Status Indicators



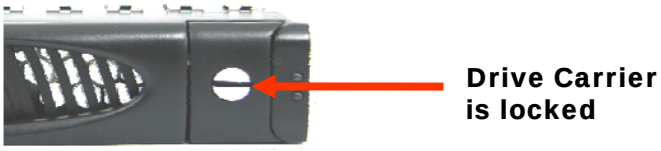
Part	Function
Disk Activity Indicator	This LED will blink blue when the hard drive is being accessed.
Disk Status Indicator	Green LED indicates power is on and hard drive status is good for this slot. If there is no hard drive, the LED is Red. The fault indicator depends on the RAID card or RAID Controller definition.

1.7.2 Drive Carrier Lock Indicator

Every Drive Carrier is lockable and is fitted with a lock indicator to indicate whether or not the carrier is locked into the chassis or not. Each carrier is also fitted with an ergonomic handle for easy carrier removal.



When the Lock Groove is vertical, then the Drive Carrier is unlocked.



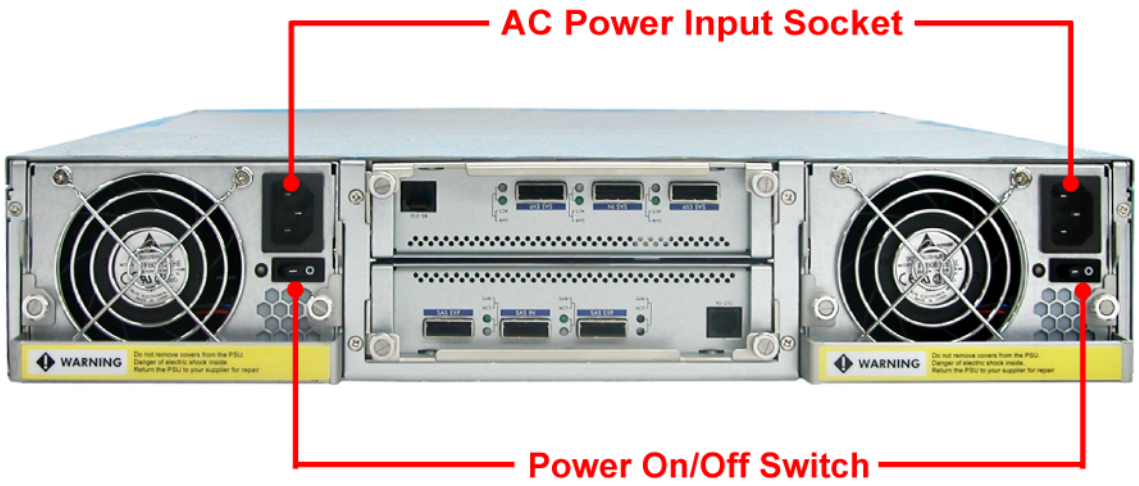
When the Lock Groove is horizontal, this indicates that the Drive Carrier is locked.

Lock and unlock the Drive Carriers by using a flat-head screw driver.

Chapter 2 Installation of JBOD Subsystem

2.1 Powering On

1. Plug in the power cords into the AC Power Input Socket located at the rear of the subsystem.



NOTE: The subsystem is equipped with redundant, full range power supplies with PFC (power factor correction). The system will automatically select voltage.

2. Turn on each Power On/Off Switch to power on the subsystem.
3. The Power LED on the front panel will turn green.

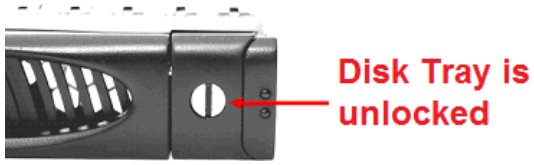
2.2 Disk Drive Installation

This section describes the physical locations of the hard drives supported by the subsystem and give instructions on installing a hard drive. The subsystem supports hot-swapping allowing you to install or replace a hard drive while the subsystem is running.

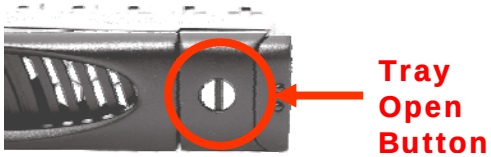
2.2.1 Installing a SAS Disk Drive in a Disk Tray

NOTE: These steps are the same when installing SATA disk drive in Single Controller Mode.

1. Unlock the Disk Trays using a flat-head screw driver by rotating the Lock Groove.



2. Press the Tray Open button and the Disk Tray handle will flip open.



3. Pull out an empty disk tray.

4. Place the hard drive in the disk tray. Turn the disk tray upside down. Align the four screw holes of the SAS disk drive in the four Hole A of the disk tray. To secure the disk drive into the disk tray, tighten four screws on these holes of the disk tray. Note in the picture below where the screws should be placed in the disk tray holes.

NOTE: All the disk tray holes are labelled accordingly.

5. Slide the tray into a slot.

6. Press the lever in until you hear the latch click into place. The HDD Fault LED will turn green when the subsystem is powered on and HDD is good.

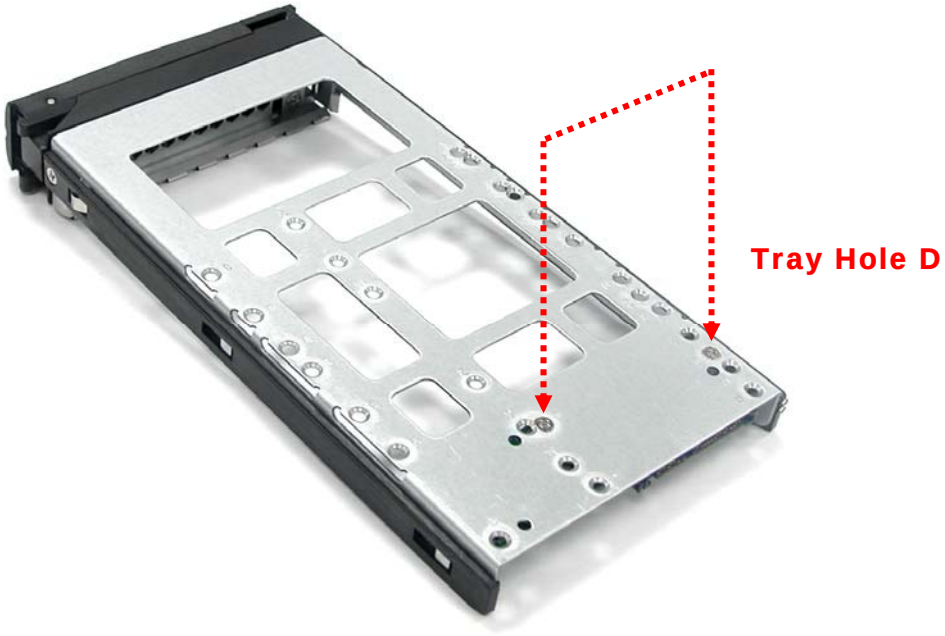
7. If necessary, lock the Disk Tray by turning the Lock Groove.

2.2.2 Installing a SATA Disk Drive (Dual JBOD Controller Mode) in a Disk Tray

1. Remove an empty disk tray from the subsystem.

2. Prepare the dongle board and two screws.

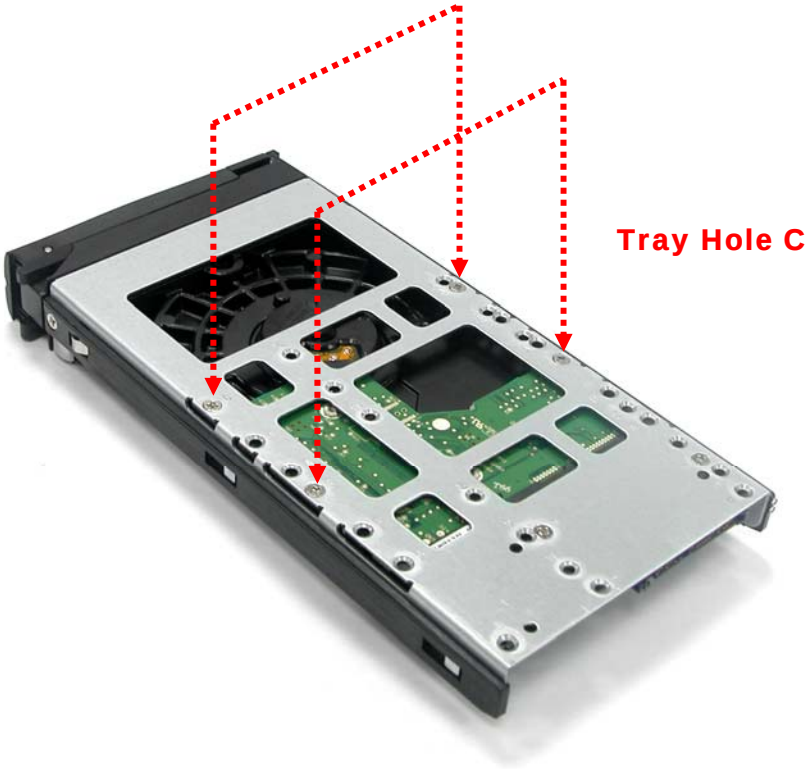
3. Place the dongle board in the disk tray. Turn the tray upside down. Align the two screw hole of the dongle board in the two Hole D of the disk tray. Tighten two screws to secure the dongle board into the disk tray.



NOTE: All the disk tray holes are labelled accordingly.

4. Place the SATA disk drive into the disk tray. Slide the disk drive towards the dongle board.

5. Turn the disk tray upside down. Align the four screw holes of the SATA disk drive in the four Hole C of the disk tray. To secure the disk drive into the disk tray, tighten four screws on these holes of the disk tray. Note in the picture below where the screws should be placed in the disk tray holes.



NOTE: All the disk tray holes are labelled accordingly.

6. Insert the disk tray into the subsystem.

2.3 Connecting the JBOD Subsystem

2.3.1 Connecting to SAS HBA

The Enclosure supports SAS interface which provides fast 300MB data transfer rate using SAS phy. The package comes with one SAS cable for single JBOD controller module, or two SAS cables for redundant JBOD controller modules.

Attach one end of the SAS cable to the SAS IN Port and the other end to the host bus adapter's (HBA) external SAS connector or to the SAS Switch. (The host bus adapter is installed in your Host computer system.)

2.3.2 Connecting to RAID Subsystem

Attach one end of the SAS cable to the SAS IN Port of the JBOD controller module and the other end to the SAS Expansion Port on the RAID controller of RAID subsystem. If configured in redundant mode, connect the other SAS cable to the SAS IN Port of the other JBOD controller, and the other end to the SAS Expansion Port on the other RAID controller of RAID subsystem.

Chapter 3 Maintenance

3.1 Upgrading Firmware

Upgrading Firmware Trough Terminal

NOTE: It is important to stop I/O access to JBOD subsystem during firmware upgrade.

NOTE: Upgrading the firmware must be done from Master JBOD Controller if the JBOD Subsystem has redundant JBOD Controllers.

1. Please use the null modem cable (RJ11 to DB9) and to connect JBOD Monitor Port and PC COM1 Port (or change to other COM Port as necessary).
2. Open Windows HyperTerminal Program. Connect using COM1 (COM Port used in Step1), Baud Rate: 115200, n, 8, 1, Flow Control: None.
3. Press the Enter key and the password prompt will be displayed.
4. Key in the password (Default password: 00000000) to login to CLI.
5. At CLI prompt, input the command to update firmware.
    a. CLI> **er dat1**
    b. CLI> **er code**

    NOTE:
    "er code" is the command to erase flash firmware code.
    "er dat1" is the command to erase CFG data code.
    "fl code" is the command to update flash firmware code (.bin file).
    "fl dat1" is the command to update CFG data code (.rom file)
    Make sure you have both files before updating.

    c. CLI> **fl dat1**
    d. Select Function menu to transfer CFG data .rom file: "Function" ➔ "Transfer" ➔ "Send File" ➔ "Browse" ➔ "Open" and select the .rom file (for example: **8010-mfgdat1-090608)** firmware folder location. Select "1K Xmodem" Protocol to send firmware file (**Only need about 15 seconds to finish sending firmware file. If not, please repeat steps C and D again**).
    e. CLI>**fl code**
    f. Select Function menu to transfer firmware file: "Function" ➔ "Transfer" ➔ "Send File" ➔ "Browse" ➔ "Open" and select the .bin file (for example: **8010-05.63.1.32-090526.bin)** from firmware folder

location. Select “1K Xmodem” Protocol to send firmware file (**Only need about 15 seconds to finish sending firmware file. If not, please repeat steps E and F again**).

NOTE: If the JBOD Subsystem has redundant JBOD Controllers, remove the serial cable (RJ11 to DB9) from RS232 Port of JBOD Controller 1 and insert in the RS232 Port of JBOD Controller 2, and then repeat steps 3 to 6 to upgrade JBOD Controller 2. After upgrading both controllers, power cycle the JBOD Subsystem. Then login to CLI to verify JBOD firmware version.

NOTE: If JBOD Subsystem has single JBOD Controller, you can use the “xr” command to restart the JBOD Controller without needing to power cycle.

g. Re-login to JBOD CLI.

h. Use “sy” command to verify JBOD firmware version.

CLI>**sy**

i. If needed, the “xr” command can also be used to restart the JBOD controller. (Normally used in single JBOD Controller mode)

CLI>**xr**

3.2 Replacing JBOD Subsystem Components

3.2.1 Replacing JBOD Controller Module

When replacing a failed JBOD Controller Module, please follow these steps:

1. Loosen the thumbscrews on the sides of the JBOD Controller Module drawer.
2. Use the Controller handle to pull out the defective JBOD Controller Module drawer.
3. Insert and slide the new JBOD Controller Module in. Note that it may be necessary to remove the old/defective JBOD Controller Module from the drawer case and install the new one.

IMPORTANT: When replacing a failed component online, it is not recommended to remove the failed component for a long period of time; proper air flow within the enclosure might fail causing high controller/disk drive temperature.

4. Tighten the thumbscrews on the sides of the JBOD Controller Module case.

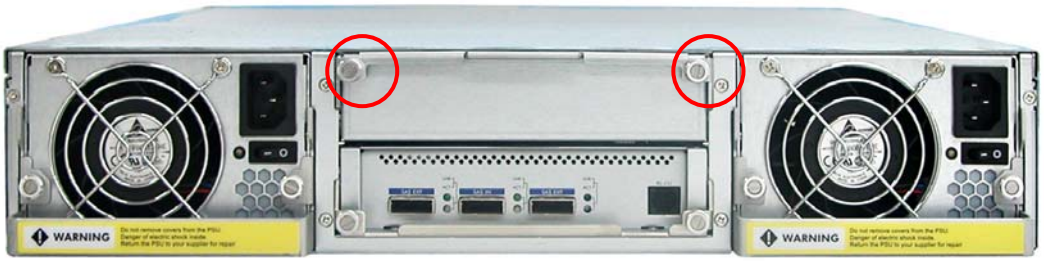
3.2.1.1 Replacing Controller Module with Plate Cover

When replacing a failed JBOD Controller Module with Plate Cover, please follow these steps:

1. Loosen thumbscrews of the failed JBOD Controller Module drawer.
2. Use the Controller Module handle to remove the failed JBOD Controller Module drawer from the subsystem.
3. Insert the JBOD Controller Plate Cover.

JBOD Controller Module Plate Cover

4. Tighten the thumbscrews of the Controller Plate Cover.



When replacing a failed component online, it is not recommended to remove the failed component for a long period of time; proper air flow within the enclosure might fail causing high controller/disk drive temperature.

3.2.2 Replacing Power Supply Fan Module

When replacing a failed power supply fan module (PSFM), please follow these steps:

1. Turn off the Power On/Off Switch of the failed PSFM.
2. Disconnect the power cord from the AC Inlet Plug of PSFM.
3. Loosen thumbscrews of the PSFM.
4. Use the handle to pull out the defective PSFM.
5. Before inserting the new PSFM, make sure the Power On/Off Switch is on "Off" state.
6. Insert and slide the new PSFM in until it clicks into place.

IMPORTANT: When the subsystem is online and a Power Supply fails, and the replacement Power Supply module is not yet available, the failed Power Supply Module can be replaced with the Plate Cover. This is to maintain proper airflow within the enclosure. (Refer to next section)

When replacing a failed component online, it is not recommended to remove the failed component for a long period of time; proper air flow within the enclosure might fail causing high controller/disk drive temperature.

7. Connect the power cord to the AC Inlet Plug of PSFM.
8. Tighten the thumbscrews of the PSFM.
9. Turn on the Power On/Off Switch of the PSFM.

NOTE: After replacing the Power Supply Fan Module and turning on the Power On/Off Switch of the PSFM, the Power Supply will not power on immediately. The Fans in the PSFM will spin-up until the RPM becomes stable. When Fan RPM is already stable, the RAID controller will then power on the Power Supply. This process takes more or less 30 seconds. This safety measure helps prevent possible Power Supply overheating when the Fans cannot work.

3.2.2.1 Replacing Power Supply Fan Module with Plate Cover

When replacing a failed power supply fan module (PSFM) with Plate Cover, please follow these steps:

1. Turn off the Power On/Off Switch of the failed PSFM.
2. Disconnect the power cord from the AC Inlet Plug of PSFM.
3. Loosen thumbscrews of the failed PSFM.
4. Pull out the defective PSFM.
5. Insert the PSFM Plate Cover carefully.